



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,672	04/30/2002	Yasushi Kurata	566.411991X00	7706

20457 7590 01/08/2004

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-9889

EXAMINER

DEO, DUY VU NGUYEN

ART UNIT	PAPER NUMBER
----------	--------------

1765

DATE MAILED: 01/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/049,672	KURATA ET AL	
	Examiner	Art Unit	
	DuyVu n Deo	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
 a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) filed 5/15/02
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 24, 26-39 are rejected under 35 U.S.C. 102(e) as being anticipated by Lee et al. (US 6,171,352).

Lee describes a polishing composition comprising: an oxidizing agent such as H₂O₂ (col. 3, line 5; col. 6, line 44); a protective-film-forming agent of benzotriazole and/or its derivatives (col. 4, line 19); an organic acid of glycolic acid (col. 3, line 23); deionized water (col. 4, line 11); 1-15 % wt of abrasive that can be any commercially available such as silica and alumina

Art Unit: 1765

(claimed colloidal silica and alumina) (col. 2, line 66-col. 3, line 2; col. 3, line 67-col. 4, line 1); pH is from 1-6 (col. 4, line 31-40) (this would include claimed pH of 3 or less); and the oxidizing agent concentration is from 1-15 % by weight (col. 2, line 64), this would include concentration within claimed 0.01-3 %wt or 0.01-1.5 %wt.

Referring to claims 27, 28, the composition further comprises polyacrylic acid copolymer or salts thereof (col. 2, line 47). This would read on claimed water-soluble polymer.

Referring to claims 34-36, 39, Lee describes the method for polishing material including Cu and Ta (col. 4, line 38; col. 7, line 54).

Referring to claims 37, 38, Lee's composition would have the polishing-rate ratio between different materials disclosed in claims 37 and 38. Support for this presumption is found by the facts that the composition includes the same compounds with the same concentrations as that of the claims. The burden is upon the applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594.

3. Claims 24, 26, 30-40 are rejected under 35 U.S.C. 102(e) as being anticipated by Kaufman et al. (US 5,95,997).

Kaufman describes a polishing composition comprising: a 0.3-12 % W oxidizing agent such as H₂O₂ (col. 4, line 14, 15); a protective-film-forming agent of benzotriazole (col. 4, line 21); an organic acid of citric acid (col. 6, line 6); deionized water (col. 4, 30); 1-15 % wt of abrasive that can be any commercially available such as silica and alumina (claimed colloidal silica and alumina) (col. 7, line 1-col. 8, line 21); pH is from 2-12 (col. 8, line 23, 24) (this would include claimed pH of 3 or less).

Art Unit: 1765

Referring to claims 37, 38, Lee's composition would have the polishing-rate ratio between different materials disclosed in claims 37 and 38. Support for this presumption is found by the facts that the composition includes the same compounds with the same concentrations as that of the claims. The burden is upon the applicant to prove otherwise. *In re Fitzgerald*, 205 USPQ 594.

Referring to claims 34-36, 39, and 40, Kaufman teaches of polishing a Ta/TaN/Cu substrates (col. 5, line 14).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee as applied to claim 38 above, and further in view of admitted prior art.

Even though Lee doesn't describe polishing a surface having a wiring and a barrier layer; however, he teaches of forming wiring circuits (col. 1, line 10-17) which is well known to one skill in the art to have a wiring and a barrier layer as described by admitted prior art in page 6, line 1-5 of the specification. Therefore, it would have been obvious for one skill in the art at the time of the invention to polish a wiring and a barrier in order to form a wire circuit with a reasonable expectation of success.

6. Claims 23, 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee or Kaufman as applied to claim 24 above, and further in view of Hardy et al. (US 6,238,592).

Referring to the average size of the abrasive, Hardly describes a average particle size of 50 nm or less (col. 9, line 65-col. 10, line 5). It would have been obvious for one skill in the art to determine the particle size in light of Hardly because Hardly further describes other processing parameters, such as average size of the abrasive, that is silent in Lee.

Even though applied prior art above does not describe standard deviation of the particle size distribution in a value of more than 5nm. It would have been obvious for one skill in the art to determine the standard deviation of the particle size distribution through test runs in order to provide a slurry for the polishing with a reasonable expectation of success.

Referring to claim 23, Hardly further teaches that the polishing medium can contain abrasive or the abrasive can be fixed to abrasive article (col. 10, line 3-7). In the latter case, the polishing medium would not contain abrasive grains. This shows that either way would be equivalent and obvious at the time of the invention.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 23 and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitations "not comprising abrasive gains" in claim 23 and "wherein said oxidizing peroxide, nitric acid, postasium periodate, hypochlorous acid and ozone water" in claim 33 are vague. At this time, the limitation "gains" will be understood as "grains" and "wherein said

Application/Control Number: 10/049,672

Page 6

Art Unit: 1765

oxidizing peroxide..." will be understood as "wherein said oxidizing agent comprising peroxide..."

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 571-272-1462.

DVD
12/30/03

92